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ZOOLOGY.—*New forms of Neotropical birds.*[1] ALEXANDER WETMORE, Biological Survey.

The four subspecies described in the present paper have been noted in the collections of the U. S. National Museum during studies of birds secured by the writer in 1920 and 1921 in southern South America. In the case of the new form of pygmy owl thanks are due Dr. F. M. Chapman of the American Museum of Natural History for the loan of an excellent series of these birds for comparison. The types of the forms here described are all in the U. S. National Museum.

Glaucidium nanum vafrum, subsp. nov.

Characters.—Similar to *Glaucidium nanum nanum* (King)[2] but with dark bars on tail broader (breadth two times or more that of the light bands); slightly larger.

Description.—Type, U. S. Nat. Mus., Cat. No. 284,856, female (in rufescent phase), from Concon, Intendencia of Valparaiso, Chile, collected April 27, 1921, by Alex. Wetmore (orig. No. 6603). Crown, nape and upper back between verona brown and warm sepia; lores, superciliary stripe and streak behind eye white streaked more or less with black; crown and nape faintly streaked and spotted with rather dull cinnamon-buff, the anterior streaks faintly bordered with black; nape with concealed markings of black, white and cinnamon-buff that appear as a broken half collar but that may be arranged to form two distinct eyespots on the back of the neck; streak below eye, including auricular region, blackish slate spotted with white and cinnamon-buff; sides of neck duller than snuff brown, barred and spotted obscurely with cinnamon-buff and, more faintly, with blackish slate; back (save as indicated above) and scapulars, slightly browner than hair brown, the scapulars spotted more or less obscurely with cinnamon-buff, and white bordered by cinnamon-buff; rump and upper tail-coverts verona brown, rump with hidden spots of cinnamon-buff; primaries and secondaries fuscous-black, barred on under surface with white, that becomes marguerite yellow proximally on inner feathers; outer webs of primaries spotted with white, margined with cinnamon-buff; outer webs of secondaries spotted with cinnamon-buff; wing coverts fuscous washed with verona brown; external ones spotted with white, all obscurely spotted with cinnamon-buff; tail fuscous-black, crossed by narrow bars of sayal brown, the dark bars twice the width of the light ones; malar stripe white; chin white with the antrorse hairlike feather tips

[1] Received July 7, 1922.

[2] *Strix nana* King, Zool. Journ. 3: 427. 1827. (Port Famine, Straits of Magellan.)

black; broad band across throat darker than bister, marked irregularly with dull cream-buff; lower fore-neck and upper breast broadly white in center; sides of fore-neck and breast duller than snuff-brown spotted obscurely with cinnamon-buff and white; remainder of underparts dull white streaked somewhat irregularly with bister; sides and flanks wood brown, somewhat mixed with white; tibiae verona brown mixed with cinnamon-buff; tarsi grizzled with white, bister, and cinnamon-buff; under wing coverts fuscous-black mixed with white. Tip of bill deep olive-buff; base puritan gray, shading to deep olive-buff at base, gray clearer on mandible, indistinct on maxilla; iris pale greenish yellow (from fresh specimen).

Measurements.—Males (2 specimens), wing 104.1–106.0, tail 70.0–76.2, culmen from cere (one specimen only) 12.0 mm. Females (2 specimens), wing 110.0–114.0,[3] tail (one specimen) 74.6,[3] culmen from cere (one specimen) 12.5 mm.[3]

Range.—Central Chile (known from Santiago, Valparaiso, Rio Blanco (altitude 1470 metres), and Tofo, sixty miles north of Coquimbo).

Remarks.—The present form, a northern race of *Glaucidium nanum*, may be expected to range northward through the Andes into Bolivia, and perhaps farther. Specimens from Temuco, Chile, near the border of the forest belt, and from the Andes in Chubut, are intermediate between *nanum* and *vafrum* but seem nearer the former. True *nanum*, from the material at hand therefore may be said to extend northward through the humid forest belt of south Chile and the southern Andes, and to be replaced beyond that point by *vafrum*.

Six skins representing *vafrum* have been examined, a male, and one marked female, doubtfully so since the wing measures only 103.7 mm. (not included in the measurements given above) from Santiago, a female from Concon, one with sex not marked from Valparaiso, a questionable male from an altitude of 1470 metres on the Rio Blanco, and a female from Tofo, sixty miles north of Coquimbo. Five specimens of *nanum*, from near the type locality in the vicinity of the Straits of Magellan (Punta Arenas, Laredo Bay and Tierra del Fuego), all agree in having the light and dark bands on the tail of about equal width. The dark tail bands in specimens from farther north become slightly broader, but even those from as far north as Temuco in Chile and northern Chubut in Argentina agree best with *nanum*. It may be noted that Scott and Sharpe (Princeton Univ. Exp. Patagonia, **2**[4]: 708. *f. 360.* 1915) figure *nanum* from Punta Arenas with a narrow tail band, as does Crawshay (Birds of Tierra del Fuego, *pl. 35.* 1907) in the case of a bird from Tierra del Fuego, and Koslowsky (El Hornero **1**: *pl. III.* Sept. 1919) in one from north of Lago Buenos Aires, Santa Cruz. In all I have examined 16 specimens that may be referred to *nanum* and 6 that represent *vafrum*.

There is considerable uncertainty as to whether *nanum* should be maintained as a distinct species or whether both *nanum* and *vafrum* should be placed as subspecies of *brasilianum*. The distinctions between the subspecies that compose *brasilianum* and the two into which *nanum* is divided

[3] Type.

are purely those of depth of coloration. Collectively the *nanum* group is darker and somewhat more heavily marked than the *brasilianum* group, while the two are complementary in range. Examination of specimens from intermediate localities may easily demonstrate intergradation.

So far as I can determine none of the names that have been proposed for pigmy owls can be referred to the subspecies here described as new. *Athene leucolaima* Bonaparte,[4] said to have come from "Oceania," is based on figures 2 and 3 on plate 4 of the atlas of Zoology of D'Urville's Voyage au Pole Sud. In Volume 3, page 55, of this work, Hombron and Jacquinot state that their specimens came from the Straits of Magellan, as is indicated by the narrowness of the dark bars on the tail. Bonaparte's name therefore is a synonym of *nanum*. The status of other names involved is so clear that discussion of them is unnecessary.

Chloroceryle americana croteta, subsp. nov.

Characters.—Similar to *Chloroceryle americana americana* (Gmelin),[5] but bill broader and heavier.

Description.—Type, U. S. Nat. Mus., Cat. No. 75019, adult male, from the Island of Tobago, collected by F. A. Ober. Hind neck, sides of head and back, rump, upper tail-coverts, wing coverts and outer webs of primaries and secondaries dusky yellowish green with a distinct sheen, becoming dusky olive-green on the crown and forehead; a half collar of white around hind neck; a few white feathers on anterior portion of lower eyelid, and a few minute white markings above the anterior end of eye; secondaries barred with white, and primaries spotted with white on inner webs; scapulars white at base; rectrices dusky bluish green above, black below; three outer rectrices extensively white at base, the white extending farther out on inner webs than on outer, and continued as spots to tip; fourth rectrix spotted with white; throat, submalar region, anterior part of sides of neck, extreme lower breast, abdomen, under tail-coverts and under wing coverts white; lower throat, and breast, save lower portion, between Sanford's brown and auburn; a line from mandibular ramus down side of throat dusky yellowish green; sides, flanks and sides of abdomen spotted heavily with dusky yellowish green; a few spots of the same color on the under tail-coverts; under wing coverts marked with blackish green. Bill, tarsus and toes black (from dried skin).

Measurements.—Males (3 specimens) wing 76.2–78.0 (76.8), tail 51.0–54.5 (53.0), exposed culmen 35.5–38.5 (37.1), tarsus 8.0–8.5 (8.2) mm. Females (2 specimens) wing 76.7–77.5 (77.1), tail 53.0–54.6 (53.8), exposed culmen 36.0–40.0 (38.0), tarsus 8.5–9.0 (8.7) mm. Type (adult male), wing 76.2, tail 53.5, exposed culmen 37.2, tarsus 8.0 mm.

Range.—Islands of Tobago and Trinidad, West Indies; mouth of Orinoco River, Venezuela (?).

Remarks.—The form recognized above is similar in size and coloration to the typical subspecies *C. a. americana* as represented by material from British Guiana, Diamantina (near Santarem) and Ceará, Brazil, save for the markedly stronger and broader bill. *C. a. cabanisi* is larger than *croteta*,

[4] Consp. Gen. Av. 1: 40. 1850.

[5] *Alcedo americana* Gmelin. Syst. Nat. 1: 451. 1788. (Cayenne.)

is paler above and has the white markings on the rectrices more extensive. From *isthmica* the new form is distinguished by smaller size and more extensive rufous brown on the throat.

One specimen in the series of *croteta* examined is marked "Orenoco River, Venezuela," without other designation. The bird in question has the heavy bill characteristic of this form, but as it is a trade skin, secured from the Museum Boucard, the locality is open to doubt.

Dyctiopicus mixtus malleator, subsp. nov.

Characters.—Similar to *Dyctiopicus mixtus mixtus* (Boddaert)[6] but more heavily streaked on entire under surface, with less extensive white markings above, and auricular patch slightly darker.

Description.—Type, U. S. Nat. Mus. Cat. No. 284,616, adult male, from Las Palmas, Chaco, Argentina, collected July 23, 1920, by Alex. Wetmore (orig. No. 4549). Forehead dark drab; crown, nape and upper hind-neck black, feathers of the crown streaked lightly with white, those of nape somewhat elongated, tipped with coral red, forming a patch on either side, more or less confluent at back; antrorse nasal plumes dull white, mixed with black filoplumes; lower hind-neck, back and rump black, barred broadly with white to pale olive-buff, the light areas slightly less in extent than the black; upper tail-coverts black bordered and tipped with large spots of white; primaries and secondaries between hair brown and chaetura drab spotted regularly and extensively with white forming regular bands; secondaries tipped with white; wing coverts black, each feather with a large irregular, sometimes heart-shaped, spot; rectrices black, barred narrowly with pale olive-buff, the bars, passing diagonally across the web toward the shaft; a streak from in front of eye behind rictus to below auricular region, and a superciliary stripe, beginning at front of eye, dull white, the superciliary stripe expanded at sides of nape into a white patch; auricular region forward to eye darker than hair brown, bordered above and behind with black; under surface dull white to pale olive-buff (more or less stained); throat and fore-neck with elongate spots of black; sides of neck and breast with prominent black streaks; sides, abdomen and under tail-coverts spotted and cross-barred heavily and irregularly with black; under wing coverts dull white, spotted with black. Maxilla dark neutral gray; mandible deep mouse gray with mandibular rami slate-gray; tarsus and toes blackish slate (from dried skin).

Measurements.—Male, one specimen (type), wing 87.4, tail 48.5, exposed culmen 19.6, tarsus 18.5 mm. Females, three specimens, wing 82.3–86.6 (84.9), tail 45–55 (49.3), exposed culmen 16.6–18.0 (17.3),[7] tarsus 17.5–19.0 (18.2) mm.

Range.—Northern Argentina from the Territory of Chaco (Las Palmas) and Tucumán (Tapia), north in the Chaco to northern Paraguay (Puerto Pinasco)

Remarks.—The subspecies described above is represented by a male and a female from Las Palmas, Chaco, a female from Tapia, Tucumán, and a female from Kilometre 80, west of Puerto Pinasco, Paraguay. It is distinguished from the typical form from Buenos Aires (represented by four

[6] *Picus mixtus* Boddaert, Tabl. Plan. Enl. 47. 1783. (Buenos Aires.)

[7] From two specimens.

skins from Conchitas and Quilmes), the type locality according to Hellmayr,[8] by the heavier, more decided streaking of the ventral surface and the reduction of the white markings on the back. Smaller bill and darker coloration distinguish *malleator* from *D. m. berlepschi* Hellmayr.

Picus maculatus Viellot,[9] based on the *Carpintero chorreado* of Azara refers to the subspecies described here but is antedated by *Picus maculatus* Scopoli[10] applied to another species of woodpecker. Other names in the synonymy of *mixtus* species refer to other forms.

Myrmorchilus strigilatus suspicax, subsp. nov.

Characters.—Similar to *Myrmorchilus strigilatus strigilatus* (Wied)[11] but male with sides, flanks and under tail-coverts between cinnamon-buff and clay color; superciliary stripe duller, not terminating in a distinct white spot posteriorly; post ocular space slightly darker than bister. Female with under tail-coverts more buffy; superciliary stripe and auricular region duller, less whitish.

Description.—Type, U. S. Nat. Mus., Cat. No. 283,862, male adult, from the Riacho Pilaga, near Kilometre 182 (Ferrocarril del Estado), Gobernación de Formosa, Argentina, collected August 11, 1920, by Alex. Wetmore (orig. No. 4712). Crown and nape streaked narrowly with dull black and cinnamon-brown, the feathers dark centrally and paler laterally, those on nape with a faint buff margin; superciliary stripe dull white, becoming buffy above eye and merging behind eye with buff on sides of nape; a line from the nasal fossa to eye, continued in a narrow line around eye, black, mixed slightly with white behind nostrils and interrupted by a small white spot near center of upper and lower eyelids; malar stripe white; band behind eye slightly darker than bister; auricular region snuff brown; upper back mikado brown streaked broadly with black; scapulars black centrally with inner margin russet and outer margin white, washed with cinnamon-buff, the latter forming a prominent light line above wing; sides of breast tawny-olive streaked with black, blending gradually with white of breast; lower back, rump and upper tail-coverts hazel, the lower back streaked broadly with black; primaries and secondaries fuscous, the outer webs washed with cinnamon near middle, and black proximally; tertials black margined broadly with cinnamon to mikado brown; wing coverts black; lesser coverts spotted slightly with white, middle coverts tipped with white, and greater coverts tipped with white shading internally to pinkish buff; primary coverts tipped narrowly with dull white and cinnamon-buff; central pair of rectrices russet; others black, the outer pair with distal half of outer web and tip white, and the others (save the median pair) tipped with the same color; chin, throat, fore-neck and center of upper breast black; sides of upper breast, lower breast and abdomen white; sides, flanks and under tail-coverts between cinnamon-buff and clay color; bend of wing black; under wing coverts white. Bill black, becoming neutral gray at base of mandible; tarsus mouse gray; iris dull brown (from recently killed specimen).

[8] Verhandl. Ornith. Ges. Bayern **12:** 212. 1915.

[9] Nouv. Dict. Hist. Nat. **26:** 19. 1818. (Paraguay.)

[10] Del. Flor. Faun. Insubr. **2:** 89. 1786. (Antigua, Panay.)

[11] *Myiothera strigilata* Wied, Beitr. Naturg. Brasilien **3:** 1064. 1831. (Bahia.)

Measurements.—Males (4 specimens), wing 65.6–66.6 (66.0), tail 56.1–60.6 (58.6), exposed culmen 16.7–17.7 (17.1),[12] tarsus 31.9–33.6 (32.6) mm. Females (3 specimens), wing 61.3–67.4 (63.9), tail 57.5–60.4 (59.2), exposed culmen 16.4–17.2 (16.7), tarsus 31.5–32.0 (31.7) mm. Type (adult male) wing 66.6, tail 60.0, exposed culmen 17.7, tarsus 31.9 mm.

Range.—Formosa (Riacho Pilaga), Rio Vermejo, and eastern Salta (?) Argentina.

Remarks.—The material on which the form described above is based has been compared with two specimens (male and female) from Bahia, the type locality of *Myiothera strigilata* of Wied. The male of *M. s. strigilatus* has the white superciliary prolonged to terminate in a prominent white spot on the side of the head, and the feathers behind the eye (above the auricular region) almost black. In addition the sides, flanks and under tail-coverts are white with very little buffy tinge. The female of typical *strigilatus* is whiter on the sides, flanks and under tail-coverts, has the superciliary stripe whiter and more prominent, and the side of the head paler. Measurements (in millimeters) of the two skins from Bahia are as follows: male, wing 64.5, tail 57.0, exposed culmen 15.5, tarsus 30.5; female, wing 61.0, tail 52.2, exposed culmen 14.0, tarsus 29.3. It will be noted that in *suspicax* the bill and tarsus seem to average slightly longer than in typical *strigilatus*.

In addition to seven specimens taken by the writer at the type locality, there is a skin in the National Museum secured by Page on the Rio Vermejo, apparently the most southern point from which the bird is recorded, since in Argentina published records indicate it as known only from eastern Salta. No specimens have been seen from the latter locality.

BOTANY.—*The two species of deerhorn cactus.*[1] N. L. BRITTON and J. N. ROSE.

In our southwestern deserts, ranging from western Texas to southeastern Arizona and extending into northern Mexico, just how far we do not know, the well-known deerhorn cactus is to be found. It is never abundant, usually growing up through other bushes with its branches often looking like dead sticks. It has an enormous turnip-like root, sometimes weighing 60 pounds. When in flower it is greatly sought after by plant-lovers. It is a night-bloomer and in the southwest is known as the Queen of the Night. When barren, the plant is difficult to find, but when in flower it can easily be located in the dark by its strong but delightful odor, and people often go into the desert seeking it, carrying lanterns not to aid in finding the flowers but only to guide them away from the thorny vegetation. The plant was long known as *Cereus greggii*, having been so-named by

[12] Average of three specimens.

[1] Received July 18, 1922.

Dr. George Engelmann for Joseph Gregg, a well-known collector of plants, but on account of its peculiar habit, flowers, fruit and seeds, it was made the type of a new genus, *Peniocereus*, by Britton and Rose in 1909.[2]

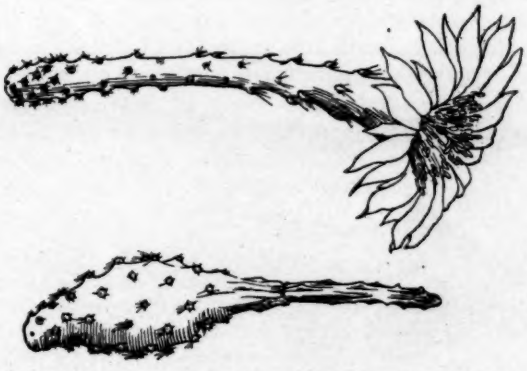

Fig. 1. *Peniocereus greggii.—Upper figure,* flower; *lower figure,* fruit.

In 1921, through the efforts of Dr. B. W. Evermann, a scientific expedition was sent out by the California Academy of Sciences to explore the islands in the Gulf of California. While engaged in the botanical work of this expedition Mr. Ivan M. Johnston collected a second species of this genus which is described as follows:

Peniocereus johnstonii Britton and Rose, sp. nov.

A climbing or clambering plant, up to 3 meters long, with a very large fleshy root, sometimes weighing 14 pounds; stems and branches 3 to 5-angled, the young growth not pubescent; spines 9 to 12, brown to black, glabrous; upper radial spines short, stubby, swollen at base, nearly black, the two lower light brown, elongated, bristle-like, reflexed; central spines 1 to 3, subulate, 4 to 8 mm. long; flower (only an old flower seen) about 15 cm. long; perianth-segments about 3 cm. long; lower and outer perianth-segments bearing tawny hairs and long bristles; flower-tube slender, with prominent areoles on knobby projections and bearing tawny wool and bristly spines; fruit ovoid to oblong, about 6 cm. long, bearing prominent clusters of black spines, dry (?), many-seeded; seeds oblong, 3 mm. long or more, black, shining; seedling dark purple; cotyledons very thick, triangular.

Collected by Ivan M. Johnston on San Josef Island, off the west coast of southern Lower California, May 28, 1921 (no. 3940, type) and June 10, 1921 (no. 4085); also on the mainland at San Nicholas Bay, Lower California, May 16, 1921 (no. 3737).

This species was always found growing up through bushes of *Olneya*.

[2] Contr. U. S. Nat. Herb. **12**: 423. 1909; BRITTON and ROSE, *Cactaceae* **2**: 112. 1920.

KEY TO THE SPECIES OF PENIOCEREUS

Young growth pubescent; areoles on flower-tube not borne on knobs; fruit bearing small inconspicuous spine-clusters; seeds dull black ..... 1. *P. greggii.*

Young growth glabrous; areoles on flower-tube borne on knobs; fruit bearing large clusters of spines at the areoles; seeds larger than in the last, shining black ..... 2. *P. johnstonii.*

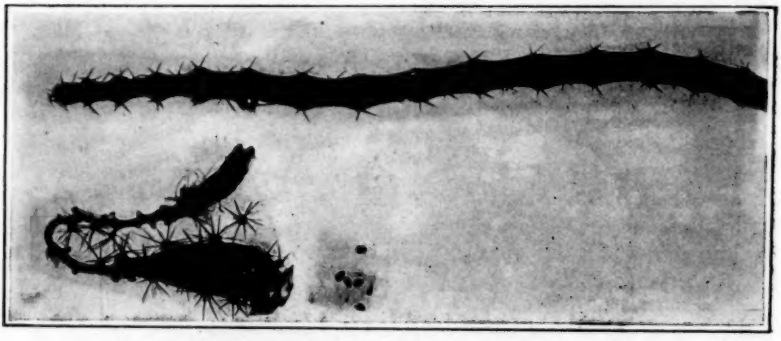

Fig. 2. *Peniocereus johnstonii.—Upper figure,* branch: *lower figures,* old flower and seeds.

BOTANY.—*Three new species of* Passiflora *from Venezuela and Ecuador.*[1] E. P. KILLIP, U. S. National Museum. (Communicated by WILLIAM R. MAXON.)

Recent botanical exploration in Venezuela and Ecuador has brought to light three new species of *Passiflora*, which are described herewith. One of them, *P. popenovii*, is cultivated for its edible fruit.

Passiflora (*Granadilla*) **dispar** Killip, sp. nov.

Stem terete, striate, glabrous; stipules ovate, 2 cm. long, 0.6 to 0.8 cm. broad, foliaceous, serrulate, aristulate; petioles 3 to 3.5 cm. long, bearing 4 to 6 stipitate glands 1.8 mm. in length; leaves ovate, 11 to 13 cm. long, 6 to 7 cm. broad, unlobed or occasionally with one lateral lobe, narrowed to an obtuse apex, subpeltate about 2 mm. above base, glabrate above, densely grayish-tomentulose beneath, palmately 5 or 7-nerved with prominulous secondary veins, reticulate, the margin entire or remotely and minutely serrulate toward the base; peduncles 2 to 2.5 cm. long; bracts ovate-lanceolate, 1 to 1.5 cm. long, 0.5 to 0.6 cm. broad, foliaceous, acute, closely callous-serrulate, the base cordate with unequal lobes; flowers 4.5 to 5.5 cm. wide; sepals ovate-lanceolate, obtuse, 2 to 2.2 cm. long, 1 cm. broad, short-horned just below apex; filaments of faucial corona in several series, the outer filiform, equaling the petals, the succeeding series capillary, barely 3 mm. high; middle corona membranous, erect, irregularly lacerate; basal corona closely

[1] Published by permission of the Secretary of the Smithsonian Institution. Received July 19, 1922.

surrounding base of gynophore, slightly folded, crenulate; gynophore 1 cm. long, glabrous; anthers linear-oblong, 7 mm. long, 2 mm. broad; ovary ellipsoidal, glabrous, glaucous; styles filiform, 6 to 7 mm. long; stigmas orbicular.

Type in the U. S. National Herbarium, no. 1,065,083, collected in forest at Guaremales, along road from Puerto Cabello to San Felipe, Carabobo, Venezuela, altitude 10 to 100 meters, May 20 to June 10, 1920, by H. Pittier (no. 8854).

This species is allied to *Passiflora gritensis* Karst. of the highlands of Venezuela, which is known to the writer only from description. In *P. gritensis* the leaves are deeply 3-parted, the divisions being acute and mucronate, and the peduncles are twice as long as the leaves. The unusual character of the bracts seems to be common to both species. Detailed description of the structure of the coronae of *P. gritensis* is lacking.

Passiflora (*Granadilla*) **perlobata** Killip, sp. nov.

Stem terete, striate, glabrous; tendrils stout, glabrous, up to 10 cm. long (in contraction); stipules narrowly linear-subulate, falcate, 8 to 9 mm. long, 1 mm. broad at base, glabrous; petioles flattened, sulcate, glabrous, 3 to 3.5 cm. long, biglandular about 8 mm. from base, the glands sessile, saucer-shaped, 1.5 mm. in diameter; leaves suborbicular in outline, 6.5 to 7 cm. long, 9 to 10 cm. broad, palmately 5 (or 7?)-lobed to within 1 cm. of base (lobes oblong, obtuse, mucronate, the apical one 6.5 cm. long, 2.5 to 3 cm. wide, abruptly narrowed at base to a width of 4 mm., the two middle lobes 4 to 4.5 cm. long, 2.5 cm. wide, narrowed at base to a width of 7 mm., the two lower lobes 2 to 2.2 cm. long, 1 to 1.3 cm. broad), cordate at base, membranous, glabrous, dark green above, paler beneath; peduncles stout, terete, 5.5 to 6 cm. long, 2 mm. in diameter; bracts free to the base, ovate, 3.5 cm. long, 2 to 2.5 cm. broad, obtuse, minutely tomentulose on both surfaces, the margin entire, becoming involute in drying, biglandular on each side near the base, the glands orbicular, 1 mm. in diameter, black, shining; flowers 8 to 10 cm. wide; sepals oblong-lanceolate, obtuse, 4 cm. long, 1.5 cm. broad, subcoriaceous, apparently green without, white within, keeled on the outer surface, the keel terminating in an awn 2.5 mm. long; petals linear-lanceolate or spatulate, 3 cm. long, 0.8 to 1 cm. broad, obtuse, membranous, rose-colored; filaments of faucial corona in several series, those of the outer ligulate, long-tapering, 2 to 2.5 cm. long, dark blue, banded with white, those of the next series linear, 3 mm. long, white at base, those of the succeeding 3 or 4 series capillary, 1.5 to 2 mm. long, pale blue and white; middle corona membranous at base, filamentose above, the filaments very numerous, 8 to 9 mm. long, spatulate, white below, blue at apex; basal corona annular, 1.5 mm. from base of gynophore; gynophore 9 mm. long, glabrous, sulcate, 2 to 3 mm. in diameter, swollen near base to a diameter of 4.5 mm.; ovary globose, glabrous.

Type in the U. S. National Herbarium, no. 1,067,545, collected at San Antonio, San Cristóbal, Venezuela, July, 1920, by Eleazar Vivas (no. 6).

This species has no very close affinities. Its deeply lobed leaves resemble those of *Passiflora coerulea*, but its linear stipules and more slender, rose-colored petals and the longer filaments of the middle corona readily distinguish it from that species. In the notes which accompany the type speci-

men the collector states that the leaves are 7-lobed. The two leaves which the specimen bears are but 5-lobed. Doubtless the lower leaves have an additional pair of lobes.

Passiflora (*Granadilla*) **popenovii** Killip, sp. nov.

Vine, up to 8 meters in length, glabrous throughout, except the ovary and outer surface of the flower tube; stem terete below, 4 or 5-angled above, striate; tendrils wirv, up to 0.8 mm. in diameter; stipules narrowly linear-subulate, 1 cm. long, 0.5 mm. broad, deciduous; petioles slender, averaging 2 cm. in length, slightly tortuose toward the base, glandless; leaves oblong-ovate or elliptic-ovate, 8.5 to 14.5 cm. long, 4 to 7 cm. wide, acuminate, rounded at base, entire, papery or pergamentaceous, lustrous on both surfaces, featherveined (lateral veins 4 or 5 pairs) and prominulous-reticulate, without ocellae; peduncles slender, elongate, 8 to 10 cm. long; bracts distinct to base, concave, 2 to 2.5 cm. long, 1.2 to 1.5 cm. broad, rounded and often cleft at apex, narrowed at base, entire, minutely puberulent on the lower part of the outer surface; flowers showy, fragrant, up to 10 cm. wide; the tube 1.2 cm. long; sepals deep rose-colored, oblong, 3 to 3.5 cm. long, 1.5 to 2 cm. broad, slightly concave, wide-spreading when developed, obtuse, keeled on the outer surface, the keel terminating in a cusp 3 mm. long; petals white, linear-oblong, 3 to 3.5 cm. long, averaging 1 cm. wide, flat, slightly reflexed; filaments of faucial corona in 4 series, the 2 outer at throat of tube, white, banded with purplish-blue, the 2 inner 3 mm. and 2 mm. from the throat, the filaments of the outermost series filiform, 1.5 cm. long, 1 mm. thick at base, slightly divaricate, those of second series ligulate, fleshy, 3 to 3.5 cm. long, 2 to 2.5 mm. wide, those of third series capillary, 1 mm. long, those of the fourth series capillary, 2 mm. long; middle corona membranous, 5 mm. long, the lower half adnate to the floor of the flower tube, the upper half free, slightly recurved; basal corona none; gynophore stout, grooved, conspicuously swollen about 1 cm. above base; ovary globose, narrowed at base, densely tomentellous; styles clavate, 6 mm. long; stigmas 3 mm. in diameter.

Type in the U. S. National Herbarium, no. 1,060,000, cultivated in volcanic loam at Baños, Tungurahua, Ecuador, at an altitude of 1,850 meters, collected March 6, 1921, by Wilson Popenoe (no. 1271).

The nearest relative of *P. popenovii* is *P. laurifolia*, widely cultivated in the West Indies under the name water-lemon. The flowers of the two species are very much alike, the coronal structure being practically identical. *Passiflora popenovii* is to be separated, however, by its thinner, more acuminate leaves, by the absence of petiolar glands, and by its more slender and more elongate peduncles.

This species is one of several cultivated in Ecuador under the name of "Granadilla de Quijos" and the edible fruit is commonly on sale in the markets of Baños and Riobamba. It is said to be indigenous on the eastern slopes of the Andes.

PROCEEDINGS OF THE ACADEMY AND AFFILIATED SOCIETIES

BIOLOGICAL SOCIETY

641ST MEETING

The 641st meeting was held at the Cosmos Club on May 13, 1922, with President BAILEY in the chair and 74 persons present. The minutes of the last meeting were read and approved. M. N. POPE and Dr. J. W. ROBERTS were elected members of the Society.

Short Notes

Dr. WHITE exhibited a fossil frog or toad in a remarkable state of preservation. It was taken from some oil shale at Elko, Nevado, and is the property of W. K. SHEELER of that place. The stratum is of Middle Miocene age, overlying beds of lignite. It seems that the development of vegetable growth in the water of that early period gradually resulted in ulmohumic acid accumulation, which apparently stopped bacterial growth and thus the frog was preserved in a medium virtually aseptic.

Mr. ALDRICH said in this connection that the shales of the Green River at the Dinosaur Monument in Utah contain many dipterous larvae which seem certainly to be those of botflies, though no reason can be thought of to account for such large numbers of these flies, now very scarce.

DR. HOWARD asked if Dr. WHITE could conjecture what animal could have been the host of such a quantity of bots. He could not offer a suggestion on the matter, however. But he added the remark that the open quarrying of oil shales on a large scale in the West, which is sure to come before many years, will be a veritable gold mine for the paleontologists.

MISS BOONE reported that she had recently visited Mr. CHAS. T. SIMPSON, formerly of the National Museum staff, at his home in Florida. He has for a long time been engaged in gathering and cultivating on a Florida hammock a large number of Florida and other tropical plants; and lately the city of Miami has adopted his place as a public park, to remain in his care.

Dr. WETMORE stated that bird notes are sometimes very unusual. Near Mt. Vernon a few days ago he heard a small bird singing an unfamiliar song from a position on a telephone wire. On inspection, it proved to be an ovenbird. He said that Mr. MCATEE had noted the same case a year earlier at almost the same place.

The first paper of the evening was by Dr. T. S. PALMER, on the subject *Twenty years of Federal protection of the buffalo.*

The first and only appropriation for the purchase of buffalo ever passed by Congress was approved by President Roosevelt July 1, 1902. It was a provision in the general deficiency bill carrying $15,000 for the purchase of buffalo for the Yellowstone National Park, providing fencing, and maintenance for one year. Under this act 21 buffalo were purchased and established at the park.

In 1902 the total number of buffalo in existence was only about 1750, of which 600 were wood bison in Canada; 200 were in a single herd, the property of Michael Pablo in Montana; 52 belonged to the government, and others in small scattered herds. The only wild buffalo were 22 in the Yellowstone National Park and 5 in Lost Park, Colorado. The government herds included 9 head in the Zoological Park here in Washington.

In 1922 the total number of buffalo in existence is over 10,000 of which 6,000 are in Canada and approximately 4,000 in the United States. The Government now has nine widely separated herds with a total of 1,250 buffalo, as follows:

Two in the east—one in Washington, D. C., in sight of the place where buffalo were first seen by white men in 1612; the other at Pisgah, N. C., not far from where buffalo were first reported in that State about 1730.

Two in the Southwest on the former range of the southern herd—one on the Wichita Game Preserve, the other in Platte National Park, in Oklahoma.

Three in the northern Plains Region, the former range of the northern herd—one at Niobrara Reservation, Nebraska; one on the Wind Cave National Park, South Dakota; and one at Sully Hill, North Dakota.

Two in the Rocky Mountain region—one near Ravalli on the former Flathead Reservation, the former home of the Canadian herd; and the other in the Yellowstone National Park.

Five of these herds are on National Parks—Zoological Park, Platte, Wind Cave, Sully Hill, and Yellowstone; four on National Game Preserves—Wichita, Oklahoma; Pisgah, North Carolina; Niobrara, Nebraska; and the Montana Bison Range.

The number of buffalo now in the government herds (1250) represents about two-thirds of the total number of buffalo living twenty years ago. All but about 130 were born on the reservations. The number of calves born last year was approximately 165.

The biological problems of chief importance are those relating to diseases, life history of the animals, and breeding. Four serious diseases are known to occur—Texas fever, gastro-enteritis, haemorrhagic septicemia, and contagious abortion.

The wide dispersal of the various government herds makes it impossible for any epidemic to entirely exterminate the species in the United States.

The length of life of a buffalo, the normal number of calves, and the normal ratio of the sexes, are still unknown. It is generally known that buffalo begin to breed the third year, and the cows have calves every other year or two years out of three, but how long they continue to breed is still to be determined. There is a record of a cow breeding in her twenty-sixth year, and one on Wichita preserve had a calf at the age of 22. The oldest buffalo on record is in Paris, said to be 31 years old. The oldest members of the government herds are a cow 24 years old on the Wichita Preserve and Kalispel Chief, the leader of the Montana herd, now 20 years old. The "ten-dollar buffalo," which lived in the Zoological Park, was upwards of 20 when he died a few years ago.

At the conclusion of the paper MAJOR SHUFELDT gave reminiscences of hunting buffalo in Montana while in army service; the army expedition of which he was a member used several for meat, which he and others shot.

Mr. ROHWER asked whether the government is doing any experimental work in crossing the buffalo with domestic cattle. Dr. PALMER said it is not, but the Canadian government has taken over some private work and expects to extend it.

Dr. WHITE called attention to the fact that Dr. PALMER had himself played a leading part in securing the establishment of the government herds.

Dr OBERHOLSER took the chair, and President VERNON BAILEY exhibited some wild animals, and at the same time gave an informal talk on *Wild*

animals as pets. The animals shown were all rodents;—the common field mouse in a cage with two types of wheel, both in active use; the small kangaroo rat of Arizona, and others. All these animals the speaker said were very readily tamed and made interesting pets. His primary object in keeping them in cages was to obtain information about their habits in the course of his professional duties, but incidentally he found them very enjoyable.

At the conclusion Mr. SMITH RILEY urged the enlargement of this line of work, in order that the economic status of these obscure little animals may be fully developed.

Dr. HOWARD spoke of a mouse plague in Italy since the war, and Major GOLDMAN mentioned one in France. J. M. ALDRICH, *Recording Secretary*.

ENTOMOLOGICAL SOCIETY

345TH MEETING

The 345th meeting of the Society was held January 5, 1922 at the National Museum, with President GAHAN in the chair and 38 persons present. C. J. HARTLEY and L. B. SMITH elected to the Society.

The paper of the evening was the Presidential Address by W. R. WALTON: *The entomology of English poetry*. It was discussed by Mr. SCHWARZ and Dr. HOWARD.

346TH MEETING

The 346th meeting was held February 2, 1922, at the National Museum, with President GAHAN in the chair and 29 persons present. Mr. ROHWER spoke briefly of a meeting of the Executive Committee at which it was agreed to cut the edition of the present volume of the Society from 500 to 400 copies. WILLIAM T. OWREY and M. D. LEONARD were elected to the Society. The program was as follows:

R. E. SNODGRASS: *The fall web worm* (Hyphantria cunea *Drury*). The paper was in a popular form and was illustrated by drawings in pen and ink and in water colors.

Mr. BUSCK made some remarks on the popular form of the paper. He also spoke of some of the characteristic protective movements of the larvae.

J. S. WADE: *On the entomological publications of the U. S. Government*. The speaker gave a list of the various Government publications relating to entomology, with the number of parts and the dates of each series. He gave a brief outline of the development of the Department of Agriculture, which started in 1836 with the Commissioner of Agriculture as its head. The Division of Entomology started in 1863, with TOWNEND GLOVER as its head.

Dr. WM. BARNES of Decatur, Illinois, spoke briefly, giving some recollections of the Society in its early years, and reminiscences of J. B. SMITH, HENRY EDWARDS and various other old time collectors.

347TH MEETING

The 347th meeting was held March 2, 1922, in Room 43 of the National Museum, with President GAHAN in the chair and 31 persons present. The program of the evening was *Notes and exhibition of specimens*.

Dr. EWING gave an illustrated talk on the *Seasonal history of Proturans*. The females are found in every month of the year and the males from January 1st to the end of February. The best time for collecting is from late September through October. Mr. CAUDELL spoke of finding the Proturans between dead leaves.

Mr. BUSCK gave an outline of his recent five months' trip in the tropics, on a survey of the pink boll worm.

Dr. HOOKER of the Experiment Station Record spoke on the subject *How can abstracts in the Record be made more useful?* There was a discussion by Messrs. HYSLOP, CUSHMAN, SCHWARZ, ROHWER and others.

Mr. CAUDELL exhibited a specimen of the imported Japanese preying mantid *Tenodera sinensis* Sauss., taken in Washington, D. C.

Mr. SCHWARZ exhibited a specimen of a male and female of the curious Calandriid beetle *Cyrtotrachelus longimanus* Fabr. from Mt. Omei, Province Tseschauan, northeast China.

Mr. SASSCER reported the interception at Baltimore, Md., by Mr. C. E. PRINCE, an Inspector of the Federal Horticultural Board, of a box in the possession of a passenger from Brazil containing miscellaneous tree and garden seeds and fifty odd packages of cotton and cotton lint. The cotton seed contained living adults, pupae and larvae of the Pink Boll worm. He also exhibited a string of so-called "Italian Beads" found in mail at San Francisco. The so-called beads were filberts infested with larvae of *Plodia interpunctella* Hbn.

C. T. GREENE exhibited three photographs showing the adult spider parasite fly *Oncodes costatus* Loew, and its eggs.

348TH MEETING

The 348th meeting was held April 6, 1922, at the New National Museum. Vice-President R. A. CUSHMAN presided and 34 persons were present.

Notes and exhibition of specimens

Dr. HOWARD spoke of a note recently published by Dr. Feysand regarding the Hymenopterous parasite *Habrobracon johannseni* Viereck stinging the larva of the potato tuber moth *Phthorimaea operculella* Zeller after it had spun the cocoon. The parasite afterwards feeds through the oviposition hole.

Mr. CUSHMAN spoke of the feeding of *Calliephialtes*, parasite of the codling moth. They feed at the punctures made by the ovipositor. He described the pumping motion employed by the parasite to bring the juice of the host within its reach.

Dr. ALDRICH said that several species of *Agromyza* puncture the leaf with the ovipositor and suck the juice for nutriment.

Dr. HOWARD brought up the matter of the estimates that have been made of the total number of described species of insects and of the total number of species that exist in the world. A general discussion followed.

Hymenoptera.—Mr. ROHWER had counted sample pages of Dalla Torre's catalogue and considered it would be conservative to consider ten valid names per page for Dalla Torre's catalogue. For the species described since Dalla Torre, Mr. ROHWER used the card catalogue in the National Museum, and after carefully estimating the number of cards he subtracted one-third for generic transfers, synonomy, reference to biology, etc. After completing these estimates he had talked to some of his colleagues and Mr. GAHAN had pointed out that for the Chalcids the estimate was, in his opinion, about two thousand too few. To prove this Mr. GAHAN had estimated the index of the volume of the Genera Insectorum and found it contained about 6500 species. It must be remembered that this volume of the Genera Insectorum contains but very little synonomy and but few species other than those which occur in Dalla Torre's catalogue. Mr. Gahan's estimate for the Chalcidoids

would be 14,633 and would average about six species to a genus. Using the Genera Insectorum for the cuckoo wasps in the same way, Mr. ROHWER thought that his estimate for this group was unnecessarily conservative as judged from the basis of the index, and that there must be at least 1,800 valid names of this group. He pointed out that it was very difficult to determine what was a valid species, but from the standpoint of taxonomic study synonomy made but little difference as for all revisionary work it is important to take all synonyms into account. He noted that according to his estimate the number of described Hymenoptera has practically doubled since Dalla Torre's catalogue and that in addition to this the classification of the Hymenoptera has undergone changes which make it difficult if not impossible, for students to find the names given them in the catalogue. He presented these facts to show the great need for a new catalogue of the Hymenoptera.

Mr. ROHWER closed his remarks by stating that he believed 90,000 would be a conservative estimate for the number of described species of Hymenoptera, and to be conservative he would multiply this by three so as to get a good estimate of the total number of species in the world. This would give a total of 270,000. A table was presented showing the number of species in the various groups.

Diptera. Dr. ALDRICH stated that he based his estimates on the catalogue of the Diptera of the world dated 1902-1910, which represents about nine-sixteenths of the species at this time, or about 44,000 species described. After comparing several genera as to species old and new he estimated that about five times this number would be a fair estimate, or 220,000 species described and undescribed for the world.

Coleoptera.—Mr. BARBER said that comparative figures indicating the number of species of beetles had been hastily gotten together but might offer a basis for an estimate. In regard to the fauna of the United States the very conservative Henshaw list of thirty-seven years ago numbered 9238 species, which was raised to 11,256 by the still very conservative third supplement, appearing ten years later. This number has grown steadily, reaching 18,644 (including the Stylopidae) by the close of 1918, according to the Leng list which reflects a slightly more liberal standard of specific differentiation.

In regard to the world fauna we can at present only compare the number of species listed in certain families in the Gemminger and Harold (Munich) catalogue of about fifty years ago with corresponding families that have been listed in the Junk catalogue within the last twelve years. A table of fifteen families out of more than a hundred usually recognized families of beetles showed an average increase of 151% in about forty-five years. If this is representative of the entire order, the 77,008 species of Coleoptera enumerated in the Munich catalogue should now be increased to about 200,000.

To base an estimate of the existing unknown species upon this estimated figure of the known forms would be mere guesswork and if one's field experience is limited to our own fauna is apt to fall far below the reality. For comparison, the speaker was one of a group of half a dozen active collectors paying special attention to the fauna of Plummer's Island and vicinity (near Washington, D. C.), but their combined efforts covering about ten years recorded only about 1300 species of beetles, while six weeks of collecting by Mr. SCHWARZ and the speaker in the humid forests of Guatemala in 1906 produced about an equal number of species, a large percentage (probably quite 25%) of which were represented only by unique examples, and although

groups were sent for inclusion in the then unpublished parts of the Biologia Centrali-Americana, probably 20% of the species still remain undescribed to this date. He believes that we know less than a tenth of the existing species of beetles.

Mr. FISHER added that the small species of Buprestidae from Malaysia contained about 90% new species. This will also apply to the species of the subfamily Lamiinae of the Cerambycidae. In the material collected in Canal Zone about 75% of the species of the tribe Agrilini, family Buprestidae were new.

Orthoptera.—Mr. ROHWER read a note prepared by Mr. CAUDELL in which he stated that Guenther in 1896 states that in 1830 there were 800 described species in Orthoptera, and in 1881 there were 6,500 species, an annual average increase of about 15%. In 1904 Caudell published an exact account of the Blattidae as 1,684. In Kirby's Synonymic Catalogue, 1904–1910, there were 17,896 species of Orthoptera. With increases since then at 1 % a year, a minimum number would total about 20,500 species.

Drs. BALL and QUAINTANCE discussed the Hemiptera but did not give any estimate in figures.

Mr. BRIDWELL made the following statement:

"I have been very much impressed with the fact that those who have spoken after tropical collecting experience have been much more liberal in their estimates than those who have collected only in the United States. My own experience in Tropical West Africa leads me to think of the tropics as exceedingly rich in species. In Nigeria I paid particular attention to the large conspicuous Braconids easily seen in flight and perhaps thirty species were taken of which only one or two species were represented by more than one or two individuals. It is only rarely the case that a species is abundant in any one place. As yet only the larger insects of the tropics have been taken, those smaller than a medium sized Coccinellid being largely unknown.

"Two remarks about beetles made to me by careful men have stuck in my mind. Dr. Peringuey, Director of the South African Museum, told me that he knew six hundred named South African Tenebrionidae and eight hundred still undescribed. An Australian Coleopterist said that while they had 40,000 Australian beetles in their lists they knew that they had 40,000 more undescribed.

"But 80,000 must be far too small a number for Australian beetles since two-thirds of the continent is still unexplored. A hundred thousand would seem nearer the facts. Malaysia and India together must have as many and the same is probably true of Eurasia and the Mediterranean, Ethiopian Africa, North America and South America.

"It has been borne in on me increasingly that the apparent great discrepancy in numbers between the Coleoptera and each of the major orders of insects is not real and that in time they will each reach much more nearly the numbers of the Coleoptera.

"Mr. ROHWER's estimate of the numbers of the Hymenoptera seems to me far too conservative."

Dr. SNYDER stated that in the Termites there were about 1,000 known species, and this number may double or possibly run to about 5,000 species.

Mr. CUSHMAN stated that in a collection of Oriental Ichneumonidae received from C. F. Baker of the University of the Philippines, together with a few from other sources, he had found about 75 apparently undescribed

species of *Xanthopimpla*, a genus distributed through the Oriental, Australian and Ethiopian regions. The Baker collections were made largely on Luzon and Mindanao, Borneo and Singapore with some from the islands of Basilau and Penang; while from other sources there are several from Formosa and a few from China and Java. There are already slightly in excess of 100 species described. He believed that as careful collecting throughout the range of this genus would at least treble the number of species.

Dr. HOWARD, in closing the discussion, ventured the opinion that, considering the character of the men who had spoken, this discussion was the most important which had been held concerning this greatly mooted matter of the number of species of insects. He believed that the number of species of insects in the world must probably exceed three millions.

Mr. BUSCK announced that the name of the spruce bud moth had been changed. This new name will be published in a forthcoming paper which will also contain a key to the species based on genital characters.

Mr. BRIDWELL reported rearing two individuals of an apparently undescribed species of the Chalcidoid genus *Perilampus* from the nests of the genus *Crabro*, one of them from *Crabro chrysarginus*. This is particularly interesting on account of its bearing upon the biology of this genus, since the manner of their oviposition is unknown. They are known to have a migratory Planidium first stage larvae and have been generally bred as parasites of hymenopterous or dipterous parasites of lepidoptera. This is apparently the first American record of a species as parasites on aculeate hymenoptera. In Europe Gaulle records *Peralampus auratus* Panzer as bred from *Solenius rubicola* and *S. vagus* by Lichtenstein. These are Crabronid wasps closely related to *Crabro chrysarginus*. These Crabronids store their nests with diptera (often flower-inhabiting) and they themselves frequent the flowers as do the insects of Perilampus. The utilization of Crabro as a host adds probability to Harry S. Smith's suggestions that Perilampus may oviposit upon flowers and the planidium be carried by insects to their food.

The planidia had evidently made this entrance into the nests of the Crabro in the fall or summer, but their development was retarded until the host material had been brought into the laboratory. The larvae were first apparent as external parasites upon the prepupal larva in the cocoon.

Mr. BARBER exhibited specimens and photos of males of *Dynastes* displaying intergradient forms between the giant "hercules beetles," $6^1/_2$ inches long, through the middle-sized form named *perseus* by Olivier (1789) to the dwarf form two inches long, known under the name *alcides* Fabr. (1787). Mr. SCHWARZ has previously discussed these forms and published a plate in our Proceedings (Proc. Ent. Soc. Wash. **10:** 70). Recently the speaker examined a series of about 20 specimens from Merida, Venezuela (Solomon Bricino & Sons) which supplies an almost continuously intergrading series between the two extremes. In this series the pair of lateral tubercles on the pronotal horn gradually comes closer to the base as the size diminishes until, in the smallest specimens, they occupy about the same position as in the common North American species *tityus*. A photo of 17 of these beetles arranged according to size was exhibited with a sketch map illustrating the habitats of the various species of *Dynastes* and it was pointed out that the Mexican species, *hyllus* Cher. 1843, may connect with our rather abundant and slightly variable *tityus* Linn. of the Southern States, and also through the plateau of Mexico, with the rather distinct Arizona species known as *granti* Horn.

Two varietal names have been proposed by Prof. F. Campos R. 1920 (Revista del Colegio Nacional Vincente Rocafuerte No. 2, p. 30, figs. 11 b-c 1920), based on the denticles of the cephalic horn, but the differences he indicates by his varietal names *unidentatus* and *bidentatus* appear irregularly among the larger individuals of the species and the varieties seem to be without biological significance. Of the three species described by A. H. Verrill in 1905 and 1906 (Amer. Journ. Sci. IV. **21**: 317) from Dominica, W. I. the first (*D. tricornis*) belongs to the genus *Strategus*, the second (*D. lagaii*) seems to be the extreme depauperate form *alcides* and the third (*D. vulcan* Verrill 1905) appears nearly equivalent to *perseus* Oliv. The description of the fourth species, *argentata* Verrill 1907 (op. cit. **24**: 305–308), appears to be based upon a large and unusually brightly colored specimen of *hercules*.

Mr. ROHWER read a note from C. A. MOSIER of Miami Beach, Fla., who sent in the head of an Orthopteron (*Belocephalus subapterus*) found attached by its powerful jaws to the lip of a cat.

C. T. GREENE exhibited specimens of the immature stages of *Hydrophorus agalma* Wheeler (Dolichopodidae).

Mr. SCHWARZ spoke of a letter from Mr. JOHN SHERMAN Jr., calling his attention to a rare book, "The Coleoptera of Georgia," by Le Conte. It contains lists of Lepidoptera, Birds and Plants, but the lists are not signed.

CHAS. T. GREENE, *Recording Secretary*.

SCIENTIFIC NOTES AND NEWS

At the call of Secretary WALCOTT, a meeting of the scientific staff of the Institution and its branches was held in the Smithsonian Chapel, Tuesday, May 23, to discuss the promotion of research in connection with the Smithsonian Institution. Several interesting research problems which could be advantageously taken up were suggested, together with means for carrying them out. A committee on research was then appointed by the Secretary, consisting of Dr. MERRILL, Chairman; Dr. COVILLE, Dr. FEWKES, Mr. FOWLE, Dr. HOUGH, Mr. NELSON, and Dr. STEJNEGER.

The committee will hear reports by individuals on proposed research projects and consider means for taking them up, and it is hoped that by fall a definite plan of action will be formulated.

At a meeting of the Executive Committee of the Institute for Research in Tropical America held June 3 in the Smithsonian Building it was decided to concentrate the efforts of the Institute on the establishment of a research station in Panama near the Gorgas Memorial Institute which is to be erected in the outskirts of the city of Panama. The members present were THOMAS BARBOUR, Harvard University; H. E. CRAMPTON, Barnard College (representing the New York Academy of Sciences); A. S. HITCHCOCK, Smithsonian Institution; and A. G. RUTHVEN, University of Michigan. Dr. WITMER STONE, Philadelphia Academy of Sciences, was absent on account of sickness.

About sixty members and guests of the Chemical Society took part in an excursion to the Endless Caverns near New Market, Virginia, on June 11. The caves are situated in the Shenandoah limestone, in the western branch of the Shenandoah Valley on the opposite side of Massanutten Mountain from the well-known Luray Caverns.

At the annual dinner of the National Academy of Sciences, held at the Hotel Powhatan on Tuesday evening, April 25, the J. Lawrence Smith medal was bestowed upon Dr. GEORGE P. MERRILL, Head Curator of Geology, in recog-

nition of his work on meteorites. This is a gold medal of the value of $200, from a fund established in 1884 as a reward for "original investigation of meteoric bodies." Because of the rarity of investigators in this field, this medal has not been given since 1888.

The American Meteorological Society held its seventh meeting in Washington on April 26. In addition to members of the Weather Bureau, the meeting was attended by representatives of the Canadian Meteorological Service and the Argentine Weather Service.

The bird collection of the late WILLIAM PALMER, consisting of about 3,000 specimens, bequeathed to the U. S. National Museum in his will, has now been turned over and catalogued in the Division of Birds. This collection is very important on account of the large number of District of Columbia records and for the number of immature and molting specimens it contains, Mr. Palmer having paid especial attention to the study of molt for many years.

The annual field meeting of the Petrologists' Club of Washington was held on May 13, 1922, under the guidance of S. G. GORDON of the Academy of Natural Sciences of Philadelphia and E. T. WHERRY of Washington. The party assembled at Perryville, Maryland, on the preceding evening and began the excursion the following morning by a visit to the granite quarry at Rock Run near Port Deposit, on the Susquehanna River. The party then visited the pegmatite dikes in the serpentine area of northern Cecil County, and studied the cross-section of the mica gneiss and phyllite along the Susquehanna from Bald Friar, Maryland, to Peach Bottom, Pennsylvania. Problems of special interest on this part of the trip were the manner of intrusion of the narrow vertical diabase dike in the gneiss near Haines, and the question as to whether the gneiss is the metamorphosed equivalent of the Martinsburg shale or represents a formation of much earlier age.

This was the third annual field meeting of the Club. The first excursion was held on May 18, 1920, when the Club examined the weathering of granite at the Tilden Street quarries, District of Columbia, and the structure of the gneisses in the vicinity of Great Falls, Maryland, under the guidance of G. P. MERRILL and C. N. FENNER. The second excursion was on May 17, 1921, and included visits to the Cambrian and pre-Cambrian rocks near Point of Rocks, and the Triassic sandstones and diabase at Dickerson, Maryland.

The following persons have become members of the Academy since the last report in the Journal (November 4, 1921, p. 443). Except where otherwise noted, the address is Washington, D. C.

Dr. ELMER DARWIN BALL, Dept. of Agriculture; Prof. ALAN MARA BATEMAN, Dept. of Geology, Yale University; Dr. A. F. BEAL, Bureau of Standards; Dr. A. W. BOSWELL; C. E. CHAMBLISS, Bureau of Plant Industry; Dr. GEORGE WHITLEY COGGESHALL, Institute of Industrial Research; J. S. CONWAY, Bureau of Lighthouses; Dr. HOWARD AUSTIN EDSON, Bureau of Plant Industry; Dr. MAURICE CROWTHER HALL, Bureau of Animal Industry; Dr. LEONARD LEE HARTER, Bureau of Plant Industry; Dr. CLYDE EVERT LEIGHTY, Bureau of Plant Industry; S. K. LOTHROP, Peabody Museum, Cambridge, Mass.; RUSSELL A. OAKLEY, Bureau of Plant Industry; R. P. PARROTT, General Electric Company; E. L. PEFFER, Bureau of Standards; Dr. A. G. PIETERS, Bureau of Plant Industry; Prof. CHARLES V. PIPER, Bureau of Plant Industry; R. L. SANFORD, Bureau of Standards; Prof. BENJAMIN SCHWARTZ, Univ. of the Philippines, Los Banos, P. I.; C. M. SMITH, Bureau of Chemistry; Dr. W. T. THOM, Jr., Geological Survey;

G. W. VINAL, Bureau of Standards; Dr. W. P. WOODRING, Geological Survey.

A. E. FATH has taken furlough from the Geological Survey to do private geologic work in foreign countries.

Prof. W. H. HOLMES and Dr. ALES HRDLICKA have been elected Honorary Associates of the Sociedad Cubana de Historia Natural "Felipe Poey" of Habana, Cuba.

CHARLES M. HOY, who for the past three years has been collecting natural history specimens in Australia and Tasmania for Dr. W. L. ABBOTT, has returned to Washington. Mr. HOY secured a very fine collection of both birds and mammals, a large number of them being new to the collection.

Drs. WALTER HOUGH and ALES HRDLICKA have been appointed delegates from the Institution to the International Congress of Americanists, to be held in Rio de Janeiro, the latter part of August. They will also represent the Institution at the International Congress on America's History, which meets at the same place on September 7.

NEIL M. JUDD, curator of American Archeology, who is conducting archeological excavations at Pueblo Bonito, New Mexico, for the National Geographic Society, arrived in the field May 3 and assembled his men and equipment. The work of excavation began May 15, and Mr. Judd holds great expectations of valuable results from this season's work.

Dr. DORSEY A. LYON, chief metallurgist of the Bureau of Mines, has received the degree of Doctor of Science from the University of Utah in recognition of his contributions to metallurgical research.

G. R. MANSFIELD has been appointed chief of the section of non-metalliferous deposits in the Geologic Branch of the U. S. Geological Survey.

Dr. CHARLES L. PARSONS sailed from New York on June 13 to attend the meeting of the International Union of Pure and Applied Chemistry at Lyons, France, June 27–July 7. Dr. PARSONS represents the United States as vice-president of the Union. Other delegates were EDWARD BARTOW, E. S. CHAPIN, R. B. MOORE of the Bureau of Mines, E. W. WASHBURN of the National Research Council, and H. S. WASHINGTON of the Geophysical Laboratory.

Word just received from the Canal Zone announces the safe arrival there of DR. F. W. PENNELL, Curator of Botany in the Academy of Natural Sciences, Philadelphia, who, accompanied by MRS. PENNELL and by MR. E. P. KILLIP of the National Museum, is en route to Colombia, where about six months will be spent in botanical exploration in the central and western cordillera. From headquarters at Cali work will extend northward to Medellin and southward toward the Ecuadorean border. The exploration should be successful not only in assembling a large amount of topotypic material but also as affording an opportunity of collecting in new and interesting territory, western Colombia being as a whole little known botanically. In this exploration the New York Botanical Garden and the Gray Herbarium are coöperating with the two institutions mentioned.

WILLIAM SCHAUS was elected, on April 5, an honorary member of the Sociedade Entomologica do Brazil in recognition of his extensive work on the butterflies and moths of Brazil.

ATHERTON SEIDELL of the Hygienic Laboratory, U. S. Public Health Service, is spending several months in Europe with the special purpose of comparing American and European methods and progress in the study of vitamines.